

# **UNIT – IV**

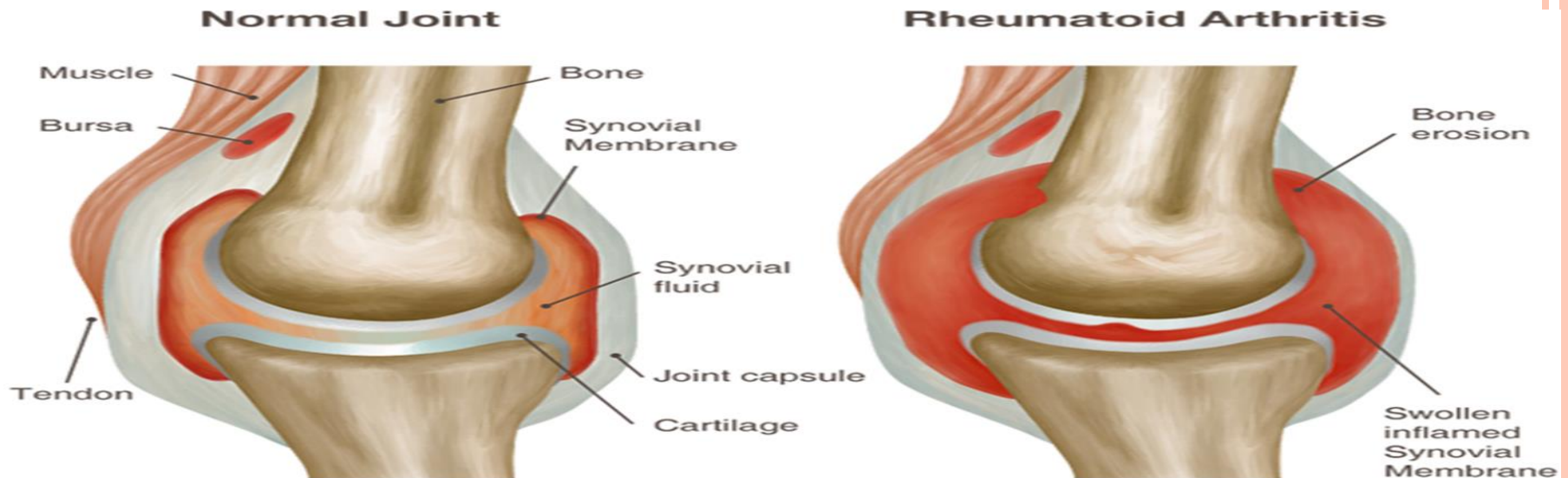
## **DISEASE OF BONES AND JOINTS**



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# 1. RHEUMATOID ARTHRITIS

- Rheumatoid arthritis is a chronic inflammatory disorder that can affect more than just your joints. In some people, the condition can damage a wide variety of body systems, including the skin, eyes, lungs, heart and blood vessels.
- An autoimmune disorder, rheumatoid arthritis occurs when your immune system mistakenly attacks your own body's tissues.



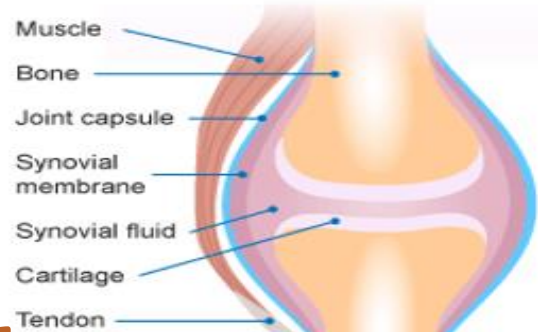
# RISK FACTORS

- Factors that may increase your risk of rheumatoid arthritis include:
  - **Your sex-** Women are more likely than men to develop rheumatoid arthritis.
  - **Age-** Rheumatoid arthritis can occur at any age, but it most commonly begins in middle age.
  - **Smoking-** Cigarette smoking increases your risk of developing rheumatoid arthritis.
  - **Excess weight-** People who are overweight appear to be at a somewhat higher risk of developing rheumatoid arthritis.



# PATHOPHYSIOLOGY

Normal joint



Rheumatoid arthritis joint



TNF-2  
IL

Inflammation

Macrophage  
Cytokines

Modification in structure of collagen and Vimentin

IN COLLAGEN & VEMENTIN

ARGININ (Amino Acid) → CITRILIN

Activate

Macrophages

Activate

T Cell

Activate

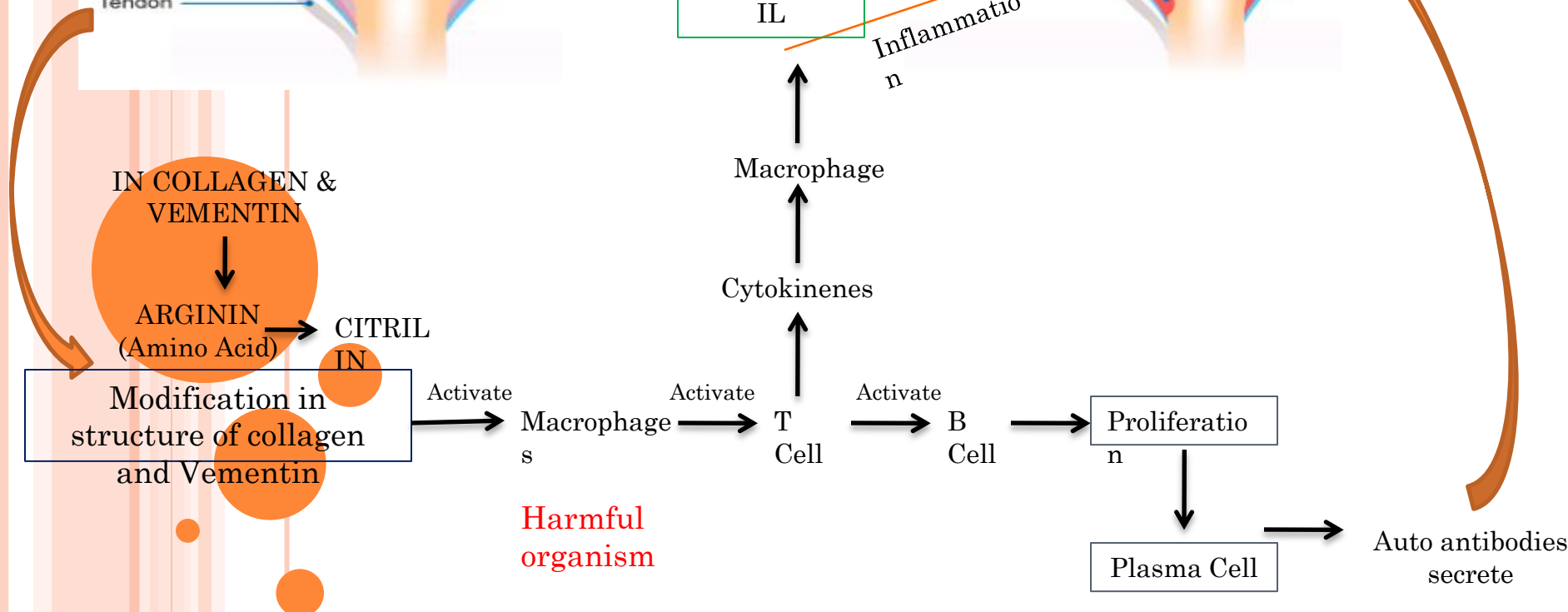
B Cell

Proliferation

Plasma Cell

Auto antibodies secrete

Harmful organism



# DIAGNOSIS

- During the physical exam, your doctor will check your joints for swelling, redness and warmth. He or she may also check your reflexes and muscle strength.
- **Blood tests**
- People with rheumatoid arthritis often have an elevated **erythrocyte sedimentation rate** (ESR, also known as sed rate) or **C-reactive protein (CRP) level**, which may indicate the presence of an inflammatory process in the body. Other common blood tests look for rheumatoid factor and **anti-cyclic citrullinated peptide** (anti-CCP) antibodies.
- **Imaging tests**
- Your doctor may recommend **X-rays** to help track the progression of rheumatoid arthritis in your joints over time. **MRI** and **Ultrasound tests** can help your doctor judge the severity of the disease in your body.



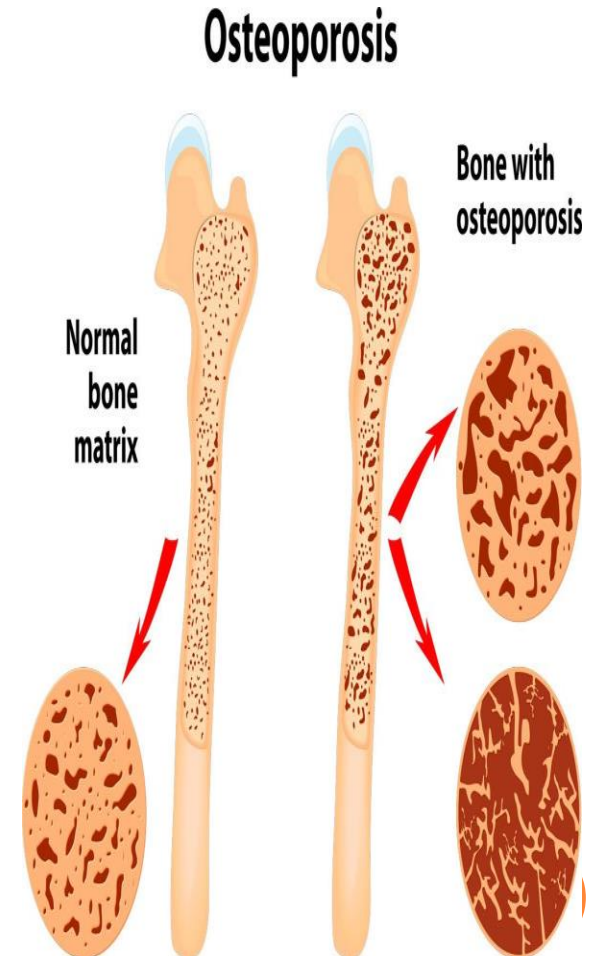
# TREATMENT

- Non-steroidal anti-inflammatory drugs (NSAIDs)
  - Ibuprofen , Naproxen
- Steroids - Prednisone



## 2. OSTEOPOROSIS

- The word ‘osteoporosis’ means ‘porous bone.’ It is a disease that weakens bones, and if you have it, you are at a greater risk for sudden and unexpected bone fractures.
- Osteoporosis means that you have less bone mass and strength.
- The disease often develops without any symptoms or pain, and it is usually not discovered until the weakened bones cause painful fractures. Most of these are fractures of the hip, wrist and spine(Vertebrae).



# TYPES OF OSTEOPOROSIS

1. Primary Osteoporosis-
  - Common type develops from 50-70 years age.
2. Secondary osteoporosis-
  - Caused by hyperparathyroidism, hyperthyroidism or leukemia and medications.
3. Idiopathic juvenile osteoporosis-
  - Children between the ages of 8 and 14.





# CAUSES OF OSTEOPOROSIS

- **Low calcium diet**
- **Lack of physical activity**
- **Gender:** Women are simply more likely to develop osteoporosis



# OSTEOPOROSIS RISK FACTORS

- Alcohol Use
- Corticosteroids Use
  - Calcium Low
  - Estrogen Low
  - Smoking
- Sedentary Lifestyle



# PATHOPHYSIOLOGY

Due to risk factors



Skeletal fragility(abnormal)



Bone structure distribution of bone material in bone space



Diameter of bone increases, thinning outer supportive cortex



Increase porous bone results in loss of bone strength and increased fracture risk



Falls significantly increases the risk of fracture especially when skeletal fragility exists



Result in loss of bone mass

# DIAGNOSIS

- X-ray Examination
  - CT Scans
  - Ultrasound
- Blood Analysis



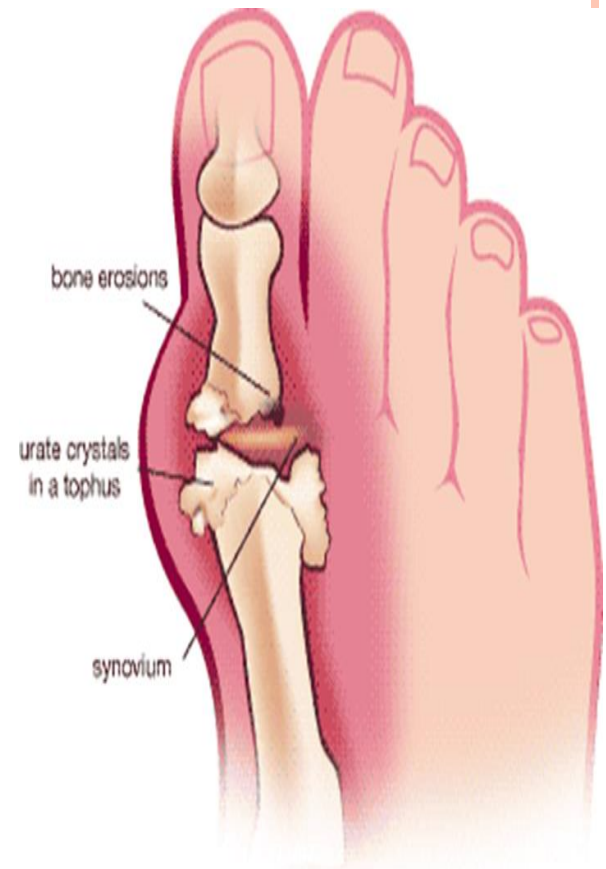
# TREATMENT

- **Medication-** Calcium and vitamin D supplements, actonel, raloxifene.
- **Diet-** vitamin and calcium diet , Milk, Cheese, Leafy vegetables.
- **Exercise-** Weight bearing exercise, walking, stimulates bone building.



### 3. GOUT

- Gout is a metabolic disorder of purine metabolism, characterized by intermittent attacks of acute pain, swelling and inflammation.
- It always preceded by hyperuricaemia (6.0mg/dl) Hyperuricaemia due to excessive amount of uric acid production or decreased excretion
- Hyperuricaemia - primary or secondary. .
- Primary hyperuricaemia classified as “Overproducers” or “under execrators”



# URIC ACID PRODUCTION AND EXCRETION

- RNA, DNA PURINES HYPOXANTHINES



Xanthine oxidase

- XANTHINES



Xanthine oxidase

- URIC ACID (low water soluble) Hyperuricemia



Gout Deposits of urate crystal



Nephrolithiasis Uric acid freely filtrated through  
by glomerulus and reabsorbed by tubular fluid

Probenecid



- Uric acid Blood React with sodium



- Sodium crystals (tophi) Deposited in soft tissues and joints Inflammation





# TREATMENT

- NSAIDS, Corticosteroids, and Colchicine
- Inhibit uric acid synthesis:- Allopurinol, febuxostate (Urostatic)
- Increase uric acid excretion:- Probenecid, Sulphinpyrazole (Urosuric)





THANK YOU